

CLAIMS

What is claimed is:

- 5        1. An apparatus for control of an alternating current appliance, said apparatus being resident in either an appliance plug or a plug-in module, and said apparatus comprising programmable control means and a plurality of electrical connections to programming means.
- 10      2. The apparatus of claim 1 wherein said plurality numbers no more than three.
- 15      3. The apparatus of claim 2 wherein said programmable control means is programmed via electronic signals from said programming means.
- 20      4. The apparatus of claim 3 wherein a high frequency signal applied to two of said no more than three electrical connections are used to place said programmable control means into a programming mode.
- 25      5. The apparatus of claim 3 wherein a series of pulses applied to two of said no more than three electrical connections are used to control both data and clock lines during programming.
- 30      6. The apparatus of claim 3 wherein a mixture of direct current and alternating current signals applied to two of said no more than three electrical connections are used to place said programmable control means into a programming mode.
- 35      7. The apparatus of claim 1 wherein said programmable control means is electronically configured to implement a set of control actions.

8. The apparatus of claim 7 wherein said programmable control means comprises a microcontroller.

9. The apparatus of claim 8 wherein said microcontroller controls an element selected from 5 the group consisting of thyristors and transistors.

10. The apparatus of claim 1 wherein the programming means operates after said programmable control means is completely assembled in the appliance plug or plug-in module.

10 11. The apparatus of claim 1 wherein said programmable control means enables the appliance plug or plug-in module to implement a set of appliance control functions other than an originally intended set, thereby providing for appliance function retrofit.

12. A method for control of an alternating current appliance, the method comprising the 15 steps of:

locating in either an appliance plug or a plug-in module programmable control means; and

providing a plurality of electrical connections between the programmable control means and programming means.

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13. The method of claim 12 wherein the plurality numbers no more than three.

14. The method of claim 13 additionally comprising programming the programmable control means via electronic signals from the programming means.

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15. The method of claim 14 additionally comprising applying a high frequency signal to two of the no more than three electrical connections to place the programmable control means into a programming mode.

16. The method of claim 14 additionally comprising using a series of pulses applied to two of the no more than three electrical connections to control both data and clock lines during programming.

5 17. The method of claim 14 additionally comprising applying a mixture of direct current and alternating current signals to two of the no more than three electrical connections to place the programmable control means into a programming mode.

10 18. The method of claim 12 additionally comprising electronically configuring the programmable control means to implement a set of control actions.

19. The method of claim 18 wherein the programmable control means comprises a microcontroller.

15 20. The method of claim 19 wherein the microcontroller controls an element selected from the group consisting of thyristors and transistors.

21. The method of claim 12 additionally comprising operating the programming means after the programmable control means is completely assembled in the appliance plug or plug-in module.

20 22. The method of claim 12 additionally comprising providing for appliance function retrofit by programming the programmable control means to enable the appliance plug or plug-in module to implement a set of appliance control functions other than an originally intended set.

25 23. An apparatus for powering an electrical network, said apparatus comprising internal electrostatic discharge protection diodes and excluding external rectification elements of a DC power supply for the electrical network, wherein said internal electrostatic discharge protection diodes perform the function of the external rectification elements.

24. The apparatus of claim 23 wherein each of said internal electrostatic discharge protection diodes are paralleled by a MOSFET transistor that forms an alternative conducting path around said internal electrostatic discharge protection diodes.

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25. The apparatus of claim 24 wherein said alternative conducting path allows firing of a thyristor during a portion of an AC cycle when said internal electrostatic discharge protection diodes are not conducting.

10 26. The apparatus of claim 23 additionally comprising an internal MOSFET transistor that is in parallel with one of said internal electrostatic discharge protection, wherein while applying the appropriate gate voltage to a thyristor the MOSFET ensures that the thyristor is turned on.